

REMARKS/ARGUMENTS

Claim 1, 2, 4, 6-9, 11, 13, 15-17, 19-22, 24, 26 and 28 stand rejected as being unpatentable over US patent No. 5,774,045 (hereinafter referred to as Helma) in view of US patent No. 2,085,798 (hereinafter referred to as Gerhard). Several dependent claims stand rejected as being unpatentable over additional combinations of references that include the above-cited combination of references. Claim 5 stands rejected as not being sufficiently definite. Applicant appreciates the recognition of allowable subject matter in connection with objected claims 3, 12, 18 and 15. Reconsideration of the rejections and objections is solicited in view of the foregoing amendment and the following remarks.

Claims 1-28 remain pending in the present application. Claim 5 has been amended.

Applicant respectfully submits that claim 5 as amended is no longer subject to any indefiniteness issues. Accordingly, it is requested that this grounds of rejection in connection with claim 5 be withdrawn.

Claim 1 is directed to a system for automatically detecting the presence of an obstacle located within a surveillance area associated with a railroad grade crossing. The system in part includes a transmitter configured to transmit a signal through the surveillance area. A modulating reflector receives the transmitted signal. The reflector comprises a phase modulator receiving the transmitted signal and generating a phase modulated signal having a characteristic introduced by the modulating reflector. The modulating reflector transmits the phase modulated signal through the surveillance area to a receiver located to receive the phase modulated signal.

Helma is directed to an arrangement for detecting an object in a region to be monitored with a transmitter device that directs a status inquiry signal at a reflector device with a transit time element (delay element) that is installed on the opposite side of the region to be monitored with respect to the transmitter device and reflects the signals received from the transmitter device, after a period of time determined by the transit time element, to a receiver unit, which is arranged opposite to the reflector

device. See, for example, the Summary of the Invention section of Helma. The Office Action correctly acknowledges that Helma fails to teach that the reflector of Helma is configured to phase modulate the transmitted signal. The Office Action then applies Gerhard with the intention of overcoming the deficiencies of Helma. However, as discussed in greater detail below, Gerhard fails to overcome the shortcomings of Helma, and consequently the Helma/Gerhard combination fails to meet the standards required for a *prima facie* obviousness rejection.

First, the modulator 7 of Gerhard does not provide phase modulation but rather it provides a different form of modulation than that recited in claim 1; namely, Gerhard discloses frequency modulation. At col. 2, lines 31-36, Gerhard expressly refers to "modulation frequencies" and further discusses effects due to "slight frequency modulations". Again, claim 1 does not recite frequency modulation, but rather phase modulation. On this basis alone, it is respectfully submitted that Gerhard fails to overcome the acknowledged deficiencies of Helma regarding the claimed invention.

Applicant submits that there is a further basis as to why Gerhard fails to overcome the deficiencies of Helma regarding the claimed invention. As described by Gerhard, the object being detected by Gerhard must be a reflective object with respect to the electromagnetic beam transmitted in the direction 5. That is, if the object 2 is not reflective, then the system of Gerhard is plainly inoperative since there would not be a reflected beam from that object in the direction 6. By way of comparison, the structural and/or operational relationships set forth in claim 1 are arranged to detect potential obstacles, whether reflective or non-reflective relative to the transmitted beam. That is, the transmitted beam would either not reach the reflector or the beam characteristics would be altered by the reflector. Notably, however, the operational relationships recited in claim 1 would not be realizable by the reflector rearwardly positioned relative to the obstacle, if the obstacle were to reflect or otherwise redirect the transmitted beam, as Gerhard describes and requires. Applicant respectfully makes reference to M.P.E.P. section 2143.01 that instructs that if the proposed modification or combination of the prior art would change the principle of operation of the prior art reference being combined, then the teachings of the references are not sufficient to render the claims

prima facie obvious. Analogous to the legal principle articulated in *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959) (quoted in the above-recited M.P.E.P section) the "suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [Gerhard] as well as a change in the basic principle under which the [Gerhard] construction was designed to operate." For example, the function of modulator 7 in Gerhard cannot be equated to the reflector element of the claimed invention since the reflector function required for Gerhard to operate, as explained above, is actually performed by the reflective object and not by modulator 7.

Applicant notes that the inapplicability of Gerhard with respect to the present invention arises since Gerhard is solely concerned with detection of reflective objects (e.g., airplanes) whereas the claimed invention contemplates detection of reflective as well as non-reflective obstacles that may be present at the rail crossing, such as humans, and animals. In the event the obstacle is a reflective obstacle, then the transmitted beam is directly reflected back by the obstacle (without reaching the reflector) and this would indicate the presence of any such obstacle. However, if the obstacle is non-reflective, then the operational relationships, as recited in claim 1, would become realizable since in this situation (inapposite to the principle of operation required by Gerhard) the reflector element provides the phase modulated reflected beam that has altered characteristics that can be detected at the claimed receiver. In summary, the principles of operation required by Gerhard are in conflict with the physical principles of the claimed invention. In view of the foregoing considerations, it is respectfully submitted that the Helma/Gerhard combination fails to provide a *prima facie* obviousness rejection. Consequently, applicant requests that this ground of rejection be withdrawn.

Claims 2-15 depend from claim 1 and thus incorporate the structural and/or operational relationships set forth in claim 1 plus their own respective recitations. It is respectfully submitted that the Helma/Gerhard combination also fails to render claims 2-15 unpatentable under the §103 statutory requirements and these rejections should also be withdrawn.

Claim 16 is directed to a method for automatically detecting the presence of an obstacle located within a surveillance area associated with a railroad grade crossing. In part, claim 16 recites phase modulating the received microwave signal by a phase modulator creating a phase modulated signal containing a characteristic. The phase modulated signal is transmitted through the surveillance area. The phase modulated signal is received at a receiver and processed to determine the characteristic within the received phase modulated signal. It is respectfully submitted that the Helma/Gerhard combination also fails to render claim 16 (as well as any dependent claims) unpatentable under the §103 statutory requirements since such a combination, as discussed above, fails to provide a *prima facie* obviousness rejection and these rejections should be withdrawn.

Applicant further notes that the additional secondary references cited in the Office Action at paragraphs 3 and 4 in connection with claims 5, 10, and 23 (Hilleary) and claims 14 and 27 (Welk), also fail to remedy the fundamental shortcomings of the Helma/Gerhard combination, as discussed above. Consequently, any such combinations, fail to render the foregoing claims unpatentable under the §103 statutory requirements since these combinations also fail to provide a *prima facie* obviousness rejection and these rejections should be similarly withdrawn.

It is respectfully submitted that each of the claims pending in this application recites patentable subject matter and it is further submitted that such claims comply with all statutory requirements and thus each of such claims should be allowed.

The Examiner is invited to call the undersigned if clarification is needed on any aspects of this Reply/Amendment, or if the Examiner believes a telephonic interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,



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